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ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION

Nest Use and Home Range of Three Abert
Squirrels as Determined by Radio TrackingDavid R. Patton¹

Abert squirrels have and use more than one nest in their home range. Three squirrels used 2, 5, and 6 nests in areas of 30, 10, and 85 acres, respectively.

Keywords: *Pinus ponderosa*, *Sciurus aberti aberti*, radio tracking.

Documenting animal use of habitat is one of the most difficult problems in wildlife research. As a result of miniaturization of electronic components, however, radio transmitters can now be made for small animals. The radio signal greatly simplifies location of the animal; then, by sight observation, information can be collected on food habits, cover requirements, and behavior activities.

This study was done to document the number of nests and size of home range used by individual Abert squirrels (*Sciurus aberti aberti*). Radio tracking requires competent field assistance and I want to acknowledge graduate students Thomas R. Ratcliff and Kenneth D. Rogers from the University of Arizona, and Richard L. Golightly from Arizona State University for their help in trapping, locating, and observing squirrels.

Methods

The study was done on the Coconino National Forest in the Beaver Creek watersheds near Happy Jack, Arizona. Squirrels were captured in Tomahawk No. 202 live traps baited

with unroasted peanuts. After a squirrel was trapped, it was transferred to a holding cone and anesthetized with metofane (methoxyflurane). One squirrel was equipped with a radio attached as a backpack. Two were equipped with radios attached to a collar (fig. 1). After the radio was



Figure 1.—Anesthetized Abert squirrel with a transmitter attached to a collar.

in place, the squirrel was left to recover in a cage before it was released at the trap site.

Considerable initial effort was spent in developing and testing the miniature transmitter

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and collar.² The collar, transmitter, and battery weighed just under 36 grams. This weight did not seem to impede the squirrel's activities.

The location of each nest used and other documented locations of individual squirrels were plotted on a small-scale map referenced to aerial photographs and numbered timber inventory stakes. Lines drawn between squirrel locations delineated the home range boundary.

Results

Squirrel No. 1 was an adult female trapped in September 1972. In 15 days of tracking, she used five different nests but did not stay more than three consecutive nights in the same nest. All of the nests were in live ponderosa pine (*Pinus ponderosa*) trees. The five nests were within a 2-acre area, but observed locations showed her home range to be 10 acres.

From criteria based on tree size and density (Patton 1974), the 10-acre home range was classed as being in optimum squirrel habitat. The area inhabited by this female was partially within a 12-acre trap site where eight adult females and five adult males were trapped from June until November 1972. The squirrel density therefore was approximately one squirrel per acre; there was considerable overlap in their home range. This tagged squirrel was killed by a hunter in October 1972.

Observations of squirrel No. 2, an adult male trapped in January 1974, were limited because he was killed by a hawk while in an open area away from cover 8 days after being released. This squirrel used two different nests in ponderosa pine in the 8-day period. One of the nests had been used by a squirrel tagged in 1973. Home range was determined to be 30 acres.

Squirrel No. 3 was an adult male trapped in February 1974. During a 31-day tracking period, this squirrel used six different nests, one in a hollow Gambel oak (*Quercus gambelii*), one in a ponderosa pine snag, and four nests in live ponderosa pine. The greatest documented consecutive number of nights spent in the same nest was three, but he was not tracked over weekends. One of the nests used was recorded as active in the summer of 1972. Home range for squirrel No. 3 was 86 acres in good habitat.

Discussion

The miniature radios proved to be of great value in documenting the number of nests being used and home range size. Receiving distance varied from 0.5 to 0.7 mile, depending on weather conditions and tree density. By using a whip antenna around the collar and a directional yaga antenna with the receiver, it was possible to go directly to the squirrel at any time.

Nest use varied from two to six per squirrel (table 1). The home range of squirrel No. 1 con-

Table 1.--Home range size and number of nest trees used by three adult Abert squirrels equipped with radio transmitters

Data recorded	Squirrel--		
	1	2	3
Sex	Female	Male	Male
Month and year trapped	Sept. 72	Jan. 74	Feb. 74
Tracking period (days)	15	8	31
Habitat rating	Optimum	Optimum	Good
Home range (acres)	10	30	85
Nest trees used (number)	5	2	6

siderably overlapped that of other squirrels, and more than one squirrel probably used the same nest at the same time. It is also possible that different squirrels used the same nest on a rotation basis. However, neither hypothesis was documented since only one squirrel at a time was tagged with a transmitter.

Of the six nests used by squirrel No. 3, two were in hollow trees. In the Southwest, pine snags and hollow oak trees are generally removed in timber harvests because they are considered to have no economic value. Because they constitute a cover component for the Abert squirrel, however, their retention should be considered. They are also important for cavity-nesting birds (Scott and Patton 1975).

Home range of squirrel No. 3 (86 acres) was 62 acres larger than the largest reported by Keith (1965) in Arizona, and 32 acres larger than that reported by Farentinos (1972) in Colorado. Both authors indicated home range is influenced by season and mating activity. There are slight indications in this study that home range is also influenced by habitat quality and population density, but more data are needed to document this relationship. Theoretically, squirrels in optimum habitat would have a smaller home range because their life necessities could be met in a smaller area.

²Beaty, D. W. Instruction, operation and usage manual for Magnum MK-1 telemetry transmitter series Models M-1 and MM-1. Copyright 1973, 1048 E. Norwood, Mesa, Arizona, 68 p.

Nest durability has been checked on several areas. Many active nests on the Coconino National Forest were at least 4 years old in 1974. One nest found on the Apache National Forest in 1965 was still in place and in good condition in July 1974.

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